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RECENT MATHEMATICAL PUBLICATIONS.

COMMUNICATED BY G. W. HILL.

THE Uranian and Neptunian Systems, investigated with the 26-inch equatorial of the U. S. Naval Observatory. By Prof. S. Newcomb. (Appendix I, Wash. Obs. for 1873.) 4to. Washington, 1875. 74 pp.

Many of our text-books attribute 8 satellites to Uranus; it is however now conclusively established that but 4 have been seen. So far as observation shows, the orbits of all the satellites of these two planets are circular, and those of Uranus lie in one plane. As this valuable paper may not be accessible to many of the readers of the ANALYST, we append the final elements arrived at. T being the fraction of a century after 1850, the position of the common plane of the orbits of the satellites of Uranus with reference to the ecliptic is given by the following inclination and longitude of ascending node

$$i = 97°.85 - 0°.013\ T,$$
$$\theta = 165°.48 + 1°.40\ T.$$

And a denoting the angle under which the radius vector of the satellite is seen at a distance whose logarithm is 1.28310, P the siderial period in mean solar days, and u the argument of the Uranocentric latitude of the satellite at the epoch 1872, Jan. 0. 0, Washington mean time, we have

	a.	P.	u.
Ariel	13″.78	2^d.520383	15°.82
Umbriel	19 .20	4 .144180	130 .56
Titania	31 .48	8 .705897	224 .00
Oberon	42 .10	13 .463269	148 .97

The mass of Uranus which corresponds to these elements is $\frac{1}{22600}$.

In like manner the elements of the satellite of Neptune, a being for the distance whose logarithm is 1.47814, and u for the epoch 1874, Jan. 0. 0, Washington mean time, are

$$i = 145°.12, \qquad \theta = 184°.50 + 1°.40\ T,$$
$$a = 16″.275, \quad P = 5^d.876900, \quad u = 101°.07.$$

The corresponding mass of Neptune is $\frac{1}{19380}$. The paper contains brief tables founded on these elements.

Lessons on Rigid Dynamics, by Rev. G. Pirie. Macmillan. New York, 1875. 8vo. $2.25.

Oeuvres de Lagrange, publices par les soins de J. A. Serret, vous les auspices de S. Exc. le Ministre de l' Instruction Publique. Tomes V–VI. Paris, 1873–4. 4to. 30 fr. per vol.

Theorie des Functions Elliptiques, par MM. Briot et Bouquet. Deuxieme Edition. Gauthier-Villars. Paris, 1875. 4to. 30 fr.

Abhandlungen von F. W. Bessel. Herausgegeben von R. Engelmann. In 3 Banden. Band I. Leipzig, 1875. 4to. 376 pp.